

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re NATIONAL PHASE Application of)
Nobuki MATSUI et al) Attn: US/DO/EO
International Application No. PCT/JP00/08881)
International Filing Date: December 14, 2000)
For: HUMIDIFICATION APPARATUS FOR FUEL CELLS) Date: August 28, 2001

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Please preliminarily amend the subject application as follows:

IN THE CLAIMS:

Please note, the amended claims are presented below in their amended form. Further, as an Attachment to the Amendment the amendments to the claims are outlined using the conventional method of bracketing and underlining.

6. **(AMENDED)** The fuel cell humidification apparatus of claim 3, wherein said humidification means **(31)** includes a first humidification section **(32)** which humidifies air or gas with water vapor in hydrogen electrode exhaust gas and a second humidification section **(36)** which humidifies said air or gas humidified in said first humidification section **(32)** with water vapor resulting from permeation of heated hot water through a water vapor permeable membrane **(38)**.

7. **(AMENDED)** The fuel cell humidification apparatus of claim 2, wherein said humidification means (31) is arranged so that water vapor contained in oxygen electrode exhaust gas expelled from said oxygen electrode of said fuel cell (1) penetrates through said water vapor permeable membrane (34) and then supplied to oxygen containing gas to said fuel cell (1).

11. **(AMENDED)** The fuel cell humidification apparatus of claim 9 wherein said humidification means (31) includes a first humidification section (33) which humidifies air or gas with water vapor in oxygen electrode exhaust gas and a second humidification section (37) which humidifies said air or gas humidified in said first humidification section (33) with water vapor resulting from permeation of heated hot water through said water vapor permeable membrane (38).

12. **(AMENDED)** The fuel cell humidification apparatus of claim 9, wherein said humidification means (31) is arranged so that water vapor contained in hydrogen electrode exhaust gas expelled from said hydrogen electrode of said fuel cell (1) penetrates through said water vapor permeable membrane (34) and then supplied to oxygen containing gas to said fuel cell (1).

17. **(AMENDED)** The fuel cell humidification apparatus of claim 1, wherein said water vapor permeable membrane (34), through which water vapor contained in exhaust gas penetrates, is a hydrophilic membrane.

18. **(AMENDED)** The fuel cell humidification apparatus of claim 1, wherein said water vapor permeable membrane (34), through which water vapor contained in exhaust gas penetrates, is a polymer membrane having a sulfonic acid group.

19. **(AMENDED)** The fuel cell humidification apparatus of claims 6, 8, 11 or 13, wherein said water vapor permeable membrane (38) of each of said second humidification sections (36) and (37) is a hydrophobic membrane.

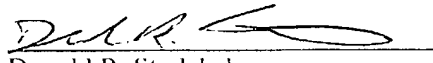
20. (AMENDED) The fuel cell humidification apparatus of claim 6, 8, 11 or 13, wherein said water vapor permeable membrane (38) of each of said humidification sections (36) and (37) is a porous membrane formed from a porous membrane of the polytetrafluoropolyethylene family, the polypropylene family, or the polyethylen family.

REMARKS

The claims have been amended to correct the improper multiple dependencies in order to place them in better condition for examination.

Examination on the merits is requested.

Respectfully submitted,


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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

6. **(AMENDED)** The fuel cell humidification apparatus of claim 3 [or claim 5], wherein said humidification means **(31)** includes a first humidification section **(32)** which humidifies air or gas with water vapor in hydrogen electrode exhaust gas and a second humidification section **(36)** which humidifies said air or gas humidified in said first humidification section **(32)** with water vapor resulting from permeation of heated hot water through a water vapor permeable membrane **(38)**.

7. **(AMENDED)** The fuel cell humidification apparatus of [any one of claims 2 through 6] claim 2, wherein said humidification means **(31)** is arranged so that water vapor contained in oxygen electrode exhaust gas expelled from said oxygen electrode of said fuel cell **(1)** penetrates through said water vapor permeable membrane **(34)** and then supplied to oxygen containing gas to said fuel cell **(1)**.

11. **(AMENDED)** The fuel cell humidification apparatus of claim 9 [or claim 10], wherein said humidification means **(31)** includes a first humidification section **(33)** which humidifies air or gas with water vapor in oxygen electrode exhaust gas and a second humidification section **(37)** which humidifies said air or gas humidified in said first humidification section **(33)** with water vapor resulting from permeation of heated hot water through said water vapor permeable membrane **(38)**.

12. **(AMENDED)** The fuel cell humidification apparatus of [any one of claims 9 through 11] claim 9, wherein said humidification means **(31)** is arranged so that water vapor contained in hydrogen electrode exhaust gas expelled from said hydrogen electrode of said fuel cell **(1)** penetrates through said water vapor permeable membrane **(34)** and then supplied

to oxygen containing gas to said fuel cell (1).

17. (AMENDED) The fuel cell humidification apparatus of [any one of claims 1 through 16] claim 1, wherein said water vapor permeable membrane (34), through which water vapor contained in exhaust gas penetrates, is a hydrophilic membrane.

18. (AMENDED) The fuel cell humidification apparatus of [any one of claims 1 through 16] claim 1, wherein said water vapor permeable membrane (34), through which water vapor contained in exhaust gas penetrates, is a polymer membrane having a sulfonic acid group.

19. (AMENDED) The fuel cell humidification apparatus of [claims 6, 8, 11, 13, 15 or 16] claims 6, 8, 11 or 13, wherein said water vapor permeable membrane (38) of each of said second humidification sections (36) and (37) is a hydrophobic membrane.

20. (AMENDED) The fuel cell humidification apparatus of [claim 6, 8, 11, 13, 15 or 16] claim 6, 8, 11 or 13, wherein said water vapor permeable membrane (38) of each of said humidification sections (36) and (37) is a porous membrane formed from a porous membrane of the polytetrafluoropolyethylene family, the polypropylene family, or the polyethylene family.